

# OPERATOR'S MANUAL

# 612051-X-E

INCLUDING: SERVICE KITS, GENERAL DESCRIPTION & TROUBLESHOOTING  
ALSO INCLUDE MANUALS: 6641X-X AIR MOTOR

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(REV. D) IPP/PSE

3" AIR MOTOR  
4:1 RATIO  
2 1/4" STROKE

## 612051-E and 612051-1-E BASIC PUMP

**IMPORTANT: READ THIS MANUAL CAREFULLY BEFORE INSTALLING,  
OPERATING OR SERVICING THIS EQUIPMENT.**

### SERVICE KITS

- Use only genuine ARO® replacement parts to assure compatible pressure rating and longest service life.
- 637066-B for repair of Air Motor section.
- Order Lower Pump End service parts separately (see figure 2).

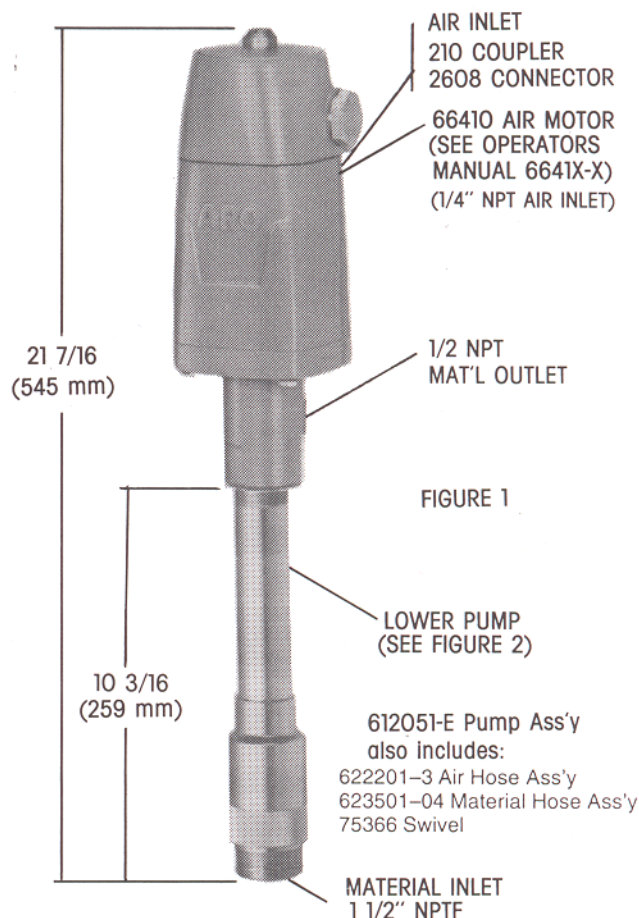
### GENERAL DESCRIPTION

This model is designed for high volume delivery of low viscosity fluids such as motor oil, gear oil or transmission fluids. The model covered by this manual includes a coupler, connector and material and air supply hoses. Material dispensing accessories and supply lines and fittings must be capable of withstanding pressures developed by pump.

- The ARO 4:1 ratio basic pump assembly consists of a 3" air motor, spacer section and ball check lower pump end.
- The ball check design provides for easy priming of the lower foot valve. Material is delivered to the pump discharge outlet on both the up and down stroke.

**RATIO x REGULATED AIR PRESSURE TO AIR MOTOR = MAXIMUM FLUID PRESSURE.**

- The 4:1 ratio is an expression of the relationship between the air motor area and the lower pump end area. When 150 p.s.i. (10 bar) air pressure is supplied to the air motor, the lower pump end will develop a maximum of 600 p.s.i. (41 bar) fluid pressure (at no flow) - as the fluid control is opened, the flow rate will increase as the air motor cycle rate increases to keep up with the demand.



### OPERATING AND SAFETY INSTRUCTIONS

- **HEED ALL WARNINGS.**
- **DO NOT EXCEED MAXIMUM WORKING PRESSURE OF 600 PSI (41 BAR) AT 150 PSI (10 BAR) AIR INLET PRESSURE.**
- **WARNING: HIGH PRESSURE DEVICE.** Improper usage of this equipment could result in serious injury. The possibility of injection into the flesh is a potential hazard. Never allow any part of the human body to come in front of or in direct contact with the material outlet. An injection injury can be serious. If injection should occur, contact a qualified physician immediately for treatment.
- **COMPONENT RUPTURE.** This pump is capable of producing high material pressure as stated on pump model plate.
- Be sure material hoses and other components are able to withstand fluid pressures developed by this pump.
- Do not operate pump continuously at speeds in excess of 75 cycles per minute.
- Disconnect air line from pump air motor when system sits idle for long periods of time.
- Materials and solvents being pumped by this pump must be compatible with the parts of this pump that come in contact with the material and solvent.
- **SERVICING.** Before servicing or cleaning pump, or removing fluid hose or gun from a unit that has been used, be sure to disconnect air lines and carefully bleed the pressure off the system.
- **WARNING: PREVENT STATIC SPARKING.** If static sparking occurs, fire or explosion could result. Pump, dispensing valve and containers must be grounded when handling inflammable fluids such as petroleum products, paints, lacquers, etc. and wherever discharge of static electricity is a hazard.
- Use grounded hoses (static wire) and be sure the object is grounded if it can produce a static charge.

THE ARO CORPORATION • ONE ARO CENTER • BRYAN, OHIO 43506-0151  
PH: (419) 636-4242 • FAX (419) 636-2115  
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## AIR AND LUBE REQUIREMENTS

- Excessive air pressure will shorten the life of the pump. Do not operate pump above recommended maximum pressure.
- For maximum operating efficiency. The following air supply specification should be maintained to this pump.
  - AIR PRESSURE — up to 150 P.S.I. (10 bar)
  - AIR FILTRATION — 50 micron
  - LUBRICATED AIR SUPPLY
  - AIR INLET SIZE — 1/2" NPTF
- Filtered and oiled air will allow the pump to operate more efficiently and yield a longer life to operating parts and mechanisms.
- Lack of or an excessive amount of lubrication will affect the performance and life of this pump. Use only recommended lubricants.
- **DAILY** Fill air line lubricator reservoir with a good grade of S.A.E. NO. 90W non-detergent gear oil, adjust to 1 to 2 drops per minute.
- If pump is to be inoperative for more than a few hours at a time, disconnect air supply and relieve all pressure from the system.

It is recommended that an oiler be installed in the air line as close as possible to the pump. This increases the service life of the pump by reducing wear of the air motor's internal parts.

## INSTALLATION

### FLUSH PUMP

- \_\_\_ Connect fluid hose to pump outlet. be sure all fittings are tight.
- \_\_\_ Turn air regulator knob counter-clockwise until it turns free.
- \_\_\_ Pump has been tested in oil and a small amount remains for protection against rusting. Immerse lower pump end in compatible solvent.
- \_\_\_ Connect air hose coupler to connector on FRL.
- \_\_\_ Turn air regulator knob clockwise until air motor starts.
- \_\_\_ Flush pump until oil is removed.
- \_\_\_ Disconnect air supply to air motor.
- **CAUTION: Solvent used for flushing may not be compatible with material to be pumped. If this is the case, flush again with a compatible solvent.**
- If pump is to be inoperative for an unspecified period of time, disconnect air and relieve all pressure.
- If pump does not function properly, disconnect air and relieve all pressure. Refer to Trouble Shooting.

## OPERATING INSTRUCTIONS

- \_\_\_ Turn air regulator knob clockwise until air motor starts to cycle.
- \_\_\_ Allow pump to cycle slowly until it is primed and all air is purged from the fluid hose or dispensing valve.
- \_\_\_ Turn off dispensing valve and allow pump to stall — check all fittings for leakage.
- \_\_\_ Change air regulator setting until desired pressure and flow is obtained.
- \_\_\_ Inspect airline filter, open petcock, to flush moisture or residue from bowl.
- \_\_\_ Pump is recommended to operate between 30 PSI and 150 PSI (not to exceed 75 cycles per minute).

## MAINTENANCE

The basic pump consists of two major components: 1. Air Motor, 2. Lower Pump End. The air motor is connected to the lower pump end. The air motor is removable and is to be serviced separately. Refer to air motor manual for service and parts.

- Periodically flush entire pump system with a solvent that is compatible with the material being pumped.
- Refer to Disassembly Procedures of air motor for correct breakdown.
- Disassembly should be done on a clean work bench with clean cloths to keep parts clean.
- If replacement parts are necessary, consult drawing containing parts for identification.
- Before assembling, lubricate parts where required. When assembling "O" rings or parts adjacent to "O" rings, care must be exercised to prevent damage to "O" rings and "O" ring groove surfaces.

## DISASSEMBLY

NOTE: All threads are right handed.

CAUTION: Do not mar finish on (2) tube.

- \_\_\_ Clamp pump assembly in a vise on the motor base assembly.
- \_\_\_ Unscrew (2) tube. (see page 3).
- \_\_\_ Separate motor assembly from lower pump assembly by pulling down on the lower pump assembly exposing the connector adapters between motor piston rod and material rod.
- \_\_\_ Unscrew the motor piston rod from (3) plunger by placing a wrench on the machined flats of (3) plunger.
- \_\_\_ Remove (1) Gasket.
- \_\_\_ Clamp the lower pump assembly in a vise on the (14) foot valve.
- \_\_\_ CAUTION: Do not overtighten.
- \_\_\_ Loosen (2) tube from (11) adapter with a strap wrench.
- \_\_\_ Pull (2) tube off (3) piston rod and assembly.
- \_\_\_ Unscrew (11) Adapter from (14) foot valve and remove (15) pin, (12) ball and (13) "o" ring.
- \_\_\_ Vise on machined flat of (3) piston rod, loosen (10) nut and remove (9) valve (8) seat.
- \_\_\_ Vise on machined flat of (6) body, unscrew and remove (8) seat and (7) packing cup.

## REASSEMBLY

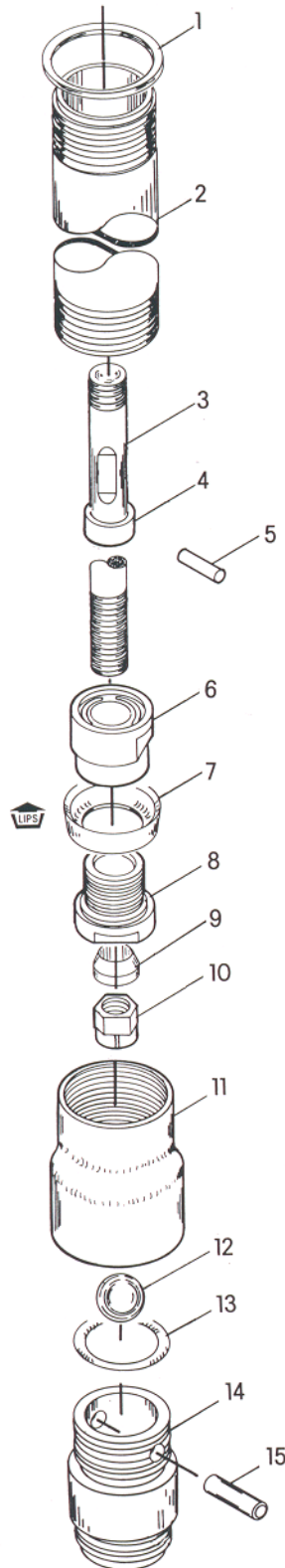
Assemble with new service parts.

- \_\_\_ Vise (14) foot valve. Place (12) ball, (13) "o" ring and (15) pin onto (14) foot valve. Screw (11) adapter onto (14) foot valve and tighten.
- \_\_\_ Vise (3) piston rod. Assemble (6) body, (7) packing cup, (8) seat and place onto (3) piston rod.

NOTE: Care must be taken in assembly of (3) piston rod so that (7) packing is not damaged.

- \_\_\_ Place (9) valve onto (3) piston rod and screw (10) nut onto rod.
- \_\_\_ Replace (1) gasket into air motor base.
- \_\_\_ Vise air motor using machine flats of air motor base.
- \_\_\_ Screw (3) piston rod and assembly into air motor piston rod.
- \_\_\_ Apply grease or lubricant to (7) cup and slide (2) tube over (3) piston rod and assembly and screw (2) tube into air motor base using a strap wrench and tighten.
- \_\_\_ Screw (11) adapter onto (2) tube.





REF.	DESCRIPTION (SIZE IN INCHES)	(QTY.)	PART NO.
1	Gasket .....		70834
2	Tube .....		72750
3	Piston Rod .....		72749
4	Collar .....		83051
5	Pin .....		Y122-85
6	Body .....		72423
7	Packing .....		F19-38
8	Seat .....		72424
9	Valve .....		72421
10	Nut .....		Y171-5
11	Adapter .....		75132
12	Ball .....		Y16-240
13	"O" Ring .....		Y325-223
14	Foot Valve .....		76419
15	Pin .....		83009

FIGURE 2

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## TROUBLE-SHOOTING

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### PROBLEM

- Material leakage out of slots in air motor base

### CAUSE

Worn Lower Pump Packings.

### REMEDY

Replace Packings. (See Fig. 2 Seal Detail)

### PROBLEM

- No material (stalled pump)

### CAUSE

Obstructed Material Line

### REMEDY

Remove Obstruction

### PROBLEM

- No material (pump continually cycles)

### CAUSE

Empty material supply

### REMEDY

Disconnect the air. Replenish material supply. Connect the air.

### PROBLEM

- Material on one stroke only (fast downstroke)

### CAUSE

(12) ball in (14) seat is not seating.

### REMEDY

Remove the foot valve. Clean and inspect ball and foot valve. If either ball or foot valve is damaged, replace.

### PROBLEM

- Material on one stroke only (fast upstroke)

### CAUSE

Worn (7) cup

### REMEDY

Replace with new (7) cup

If pump will still not operate, consult your local dealer.

